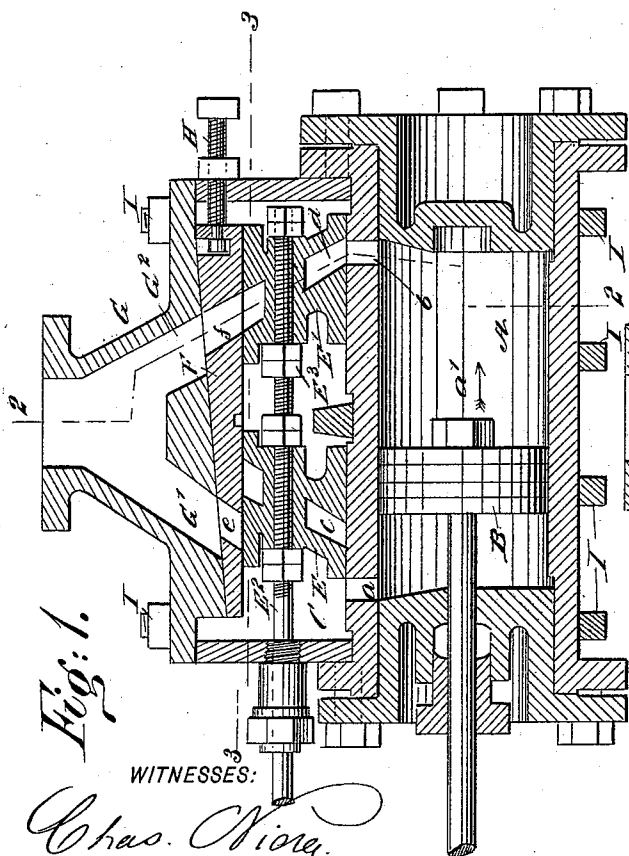
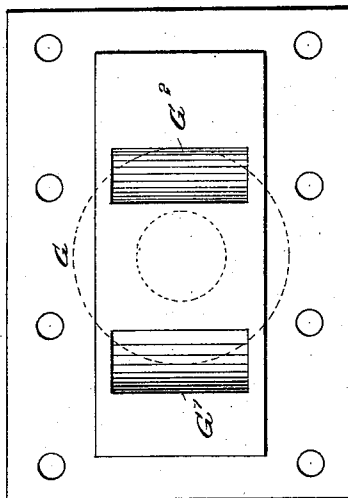
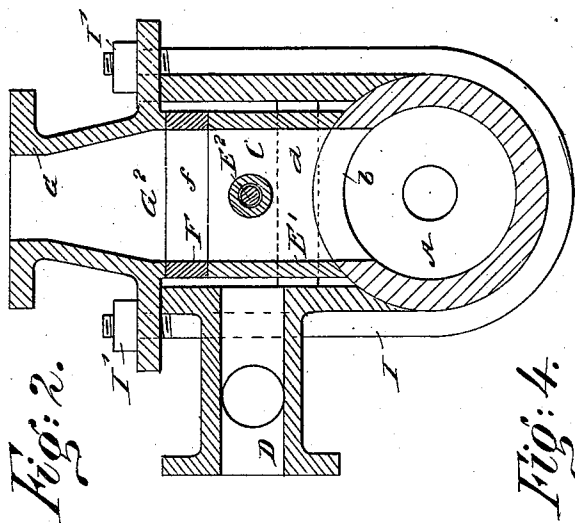


(No Model.)

A. B. VAN WEGEN.
BALANCED VALVE.

No. 534,533.

Patented Feb. 19, 1895.



WITNESSES:
Chas. Nixon
Rev. J. Foster

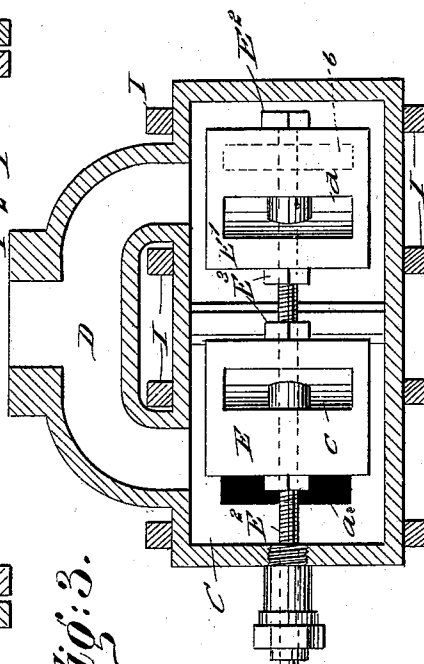


Fig: 3.

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UNITED STATES PATENT OFFICE.

ALBERT BYRON VAN WEGEN, OF COUDERSPORT, PENNSYLVANIA.

BALANCED VALVE.

SPECIFICATION forming part of Letters Patent No. 534,533, dated February 19, 1895.

Application filed November 10, 1894; Serial No. 528,416. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BYRON VAN WEGEN, of Coudersport, in the county of Potter and State of Pennsylvania, have invented a new and Improved Balanced Valve, of which the following is a full, clear, and exact description.

The invention relates to steam engine valves; and its object is to provide a new and improved valve, which is comparatively simple and durable in construction, and arranged to deliver the steam quickly and directly into the cylinder.

The invention consists principally of a steam chest, connected at its ends with the cylinder ports, a slide valve operating in the said steam chest, and provided with exhaust ports adapted to register with the cylinder ports and with ports in an adjustable plate connected with the exhaust chest.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a transverse section of the same, on the line 2—2 of Fig. 1. Fig. 3 is a sectional plan view of the same, on the line 3—3 of Fig. 1; and Fig. 4 is an inverted plan view of the exhaust chest.

The steam engine on which the valve is applied, is provided with the usual cylinder A, in which reciprocates the piston B. The ends of the cylinder A are connected by the steam inlet ports *a* and *b* with a steam chest C, formed at one side with the steam inlet D, connected by a pipe with the boiler or other steam supply. In this steam chest C are fitted to slide the valves E and E' adapted to open and close the ports *a* and *b* respectively, the said valves being also provided with exhaust ports *c* and *d* adapted to register with the ports *a* and *b* respectively. The exhaust ports *c* and *d* are likewise adapted to register with ports *e* and *f* in the adjustable plate F engaging the tops of the valves E and E', and fitted to the under side of the exhaust chest G, formed with two channels G' and G² lead-

ing to the ports *e* and *f*. A screw H engaging the wedge-shaped plate F, serves to adjust the latter relative to the wear of the sliding valves E and E', so that a steam-tight joint is at all times formed between the valves, the plate F and the exhaust chest G.

The valves E and E' are connected with each other by a valve stem E², the connection being made by nuts E³ screwing on the threaded inner end of the stem E², so as to permit of properly adjusting the valves relative to the ports.

In order to fasten the several parts in position on the cylinder A, I provide clips I passing around the cylinder at the under side, and extending along the sides of the chest C, to pass through flanges on the exhaust chest G. As indicated in Fig. 2, the nuts I' screwing on the ends of the clips, press on top of the flanges of the exhaust chest G. See Fig. 2. The channels G' and G² are made sufficiently wide, to at all times connect fully with the ports *e* and *f*, even if the plate F is adjusted to take up wear, by the operator manipulating the screw H.

The bearing surface of the valves E and E' on the cylinder A is preferably shaped according to the exterior surface of the cylinder, as indicated in Fig. 2, but a straight bearing surface may be provided if desired.

Now, it will be seen that when the several parts are in the position illustrated in Fig. 1, then the steam chest C is filled with steam from the inlet D, and steam can pass from the said chest, directly through the port *a* into the left end of the cylinder A to act on the piston B, to push the latter on the outward stroke in the direction of the arrow *a'*. The steam in front of the piston B, passes through the registering ports *b*, *d*, *f* and channel G², into the exhaust chest G, to pass to the outer air, a condenser or other device. The port *e* in the plate F is now closed, and the port *c* is closed at both ends. When the piston B nears the end of its outward stroke, the valve stem E² shifts the valves E and E' to the left, so that the port *a* is connected by the port *c* with the port *e*, while the other ports *d* and *f* are cut off, and the port *b* is opened to permit live steam from the chest C to pass through the port *b*, into the outer end of the cylinder A to act on the piston B

therein, to cause the latter to move on its inward stroke in the inverse direction of the arrow *a'*.

It will be seen that by the arrangement described, full provision is made for delivering the steam directly from the chest C, through the straight ports *a* and *b*, into the ends of the cylinder A, so that the steam is not liable to lose any of its valuable properties by cooling, friction, or the like. Consequently, the steam is utilized to the fullest extent. Furthermore, the wear can readily be taken up at all times, by adjusting the plate F so that a steam-tight joint is formed between the valves, plate and exhaust. As the valves E and E' are narrower than the width of the steam chest C, the steam in the latter can circulate completely around the sides and ends of the valve, so that the valve can freely move within the steam chest without requiring much pushing or pulling power.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A slide valve having exhaust ports, a steam chest in which reciprocates the said slide valve, the steam chest being connected with a steam supply and by ports with the interior of the cylinder, and a plate having

ports adapted to register with the said valve ports and with the exhaust, the said plate being made wedge-shaped and provided with adjustable means for taking up the wear between the valve and the plate, substantially as shown and described.

2. The combination of a steam chest, having a steam inlet and an exhaust outlet, a slide valve comprising a valve-rod and two valves mounted thereon and each provided with one port and an adjustable wedge-shaped plate arranged between said valves and the top of the chest, substantially as set forth.

3. The combination of a steam chest, having a steam inlet and an exhaust outlet at its top a slide valve comprising a valve rod and two valves mounted thereon and each provided with an exhaust port extending through it and adapted to communicate between the exhaust outlet of the steam chest and the ports of the cylinder and an adjustable wedge-shaped plate arranged between the valves and the top of the chest, substantially as set forth.

ALBERT BYRON VAN WEGEN.

Witnesses:

H. A. SCOVILLE,
WM. A. SHEAR.